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T H E
E L E V A T I O N, S E C T I O N,
P L A N, A N D V I E W S,
O F A
T R I P L E V E S S E L,
A N D O F
W H E E L S.

W I T H
EXPLANATIONS OF THE FIGURES IN THE ENGRAVING,

A N D A
SHORT ACCOUNT OF THE PROPERTIES AND
ADVANTAGES OF THE INVENTION.

By PATRICK MILLER, Esq; of Dalswinton.

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PRINTED BY J. JOHNSON, ST. PAULS CHURCH-YARD

T H E
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A N D
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INVENTIONS which have a tendency to promote the happiness, or to increase the comforts of mankind in general, should, as soon as they have been brought to any degree of maturity, and can be described with tolerable precision, be communicated to the world at large.

Impressed with this sentiment, I have caused to be engraved a plan and views of a TRIPLE VESSEL, constructed on a new principle, and also a plan and view of a WHEEL to give her motion through the water. That engraving, with explanations, is subjoined. The PROPERTIES peculiar to vessels so constructed, with the BENEFITS which may be expected to result from them to society, I shall endeavour to describe as clearly as the nature of the subject will allow.

The

The years I have applied myself to this subject, and the many experiments I have made with vessels which I caused to be built for the sole purpose of improving Naval Architecture, have given rise to the INVENTION which I now communicate.

I must first remark, however, that the vessel of which the engraving gives a faithful representation, is by no means intended, in all respects, as a model, as I shall hereafter explain. I built her singly with a view to elucidate and demonstrate the truth of the principles on which my invention depends; but limited and confined by the influence of a law which prescribes the proportions that the breadths of ships must bear to their lengths.

The FIRST and principal PROPERTY of vessels constructed upon the plan here communicated, is derived from the WHEELS, the mechanism of which is simple and obvious. To work them, seamanship is not requisite; for it can be performed even by the most ignorant; strength and agility, in the men employed, being all that is necessary.

From the experiments I have made in different vessels with the WHEELS wrought by cranks, as shown in the Plan, it appears to me, that ships, however great their burden, if there be no wind, and the water is smooth, may be made to pass through it at the rate of from three to four miles an hour.

When the movement of the WHEEL comes to be aided by mechanical powers, so as to accelerate its revolutions, the before mentioned rate of a ship's going through the water will be in proportion to the power used.

I have also reason to believe that the power of the STEAM ENGINE may be applied to work the WHEELS, so as to give them a quicker motion, and, consequently,

consequently, to increase that of the ship. In the course of this summer, I intend to make the experiment ; and the result, if favourable, shall be communicated to the public.

When there is wind sufficient to make the vessel, by means of the sails, go five miles an hour, the **WHEELS** are raised out of the water, as then they rather retard than aid the ship's motion.

The small **DRAUGHT** of **WATER** of vessels of this construction may be considered as the **NEXT**, if not their chief property.

For the purposes of inland navigation, they may be so constructed, as to go where the depth of water is from 20 to 24 inches.

Vessels built to draw three feet of water will make good Coasters.

Ships drawing from five to six feet of water will be very fit for the longest voyages.

STIFFNESS, a term well known to seamen, is a **THIRD** distinguished property of these vessels ; as, of the three, the lee-vessel must be immersed in the water before the ship can overfet ; they carry more sail than any other vessels of the same tonnage. From this power of carrying much sail with safety, and from their displacing less water than other vessels of the same burden, there is every reason to expect that they will sail with greater velocity.

Although, from the few experiments I have yet made with the **TRIPLE VESSEL**, I have not been able to ascertain this matter with precision, I believe, from what I have seen, that, if they are rightly constructed, and the masts and sails judiciously made, they will, in favourable situations, run fif-

teen or sixteen miles an hour. It is probable that, by improvements which further experience may suggest, this velocity may be increased.

A FOURTH important property of these vessels is, that of their making little or no LEE WAY, and which I am convinced of from the experiments I have made. Their HEEL, when upon a wind, being inconsiderable, the three Keels become thereby effective Lee Boards ; a circumstance of great advantage when they are beating to windward.

These vessels have other PROPERTIES that deserve to be mentioned. They require no BALLAST, which must afford great room for the stowage of fuel, water, and provisions ; an essential particular in long voyages, with numerous crews.

From their great BUOYANCY, they will readily rise on the sea, and therefore be less exposed to the danger of the waves breaking over them, than heavy ships which draw much water.

The BENEFITS resulting from the PROPERTIES above enumerated, and which must follow from the employing ships and other vessels constructed ON THESE PRINCIPLES, are many and striking.

When there is wind, they must sail quicker than other ships ; and as, during calms and light winds, they will, by means of the WHEELS, advance, when other ships make no progress, the duration of voyages will thus be considerably shortened. Sea-risks being very much in proportion to the duration of the voyage, it is obvious that many lives, and much property, will be thereby daily preserved to the world, and that, independent of the advantages which commerce must derive from the saving of time, and a speedier intercourse of nations.

Their

Their remarkable STIFFNESSES render them the fittest vessels for rivers and canals, as every year many lives are lost by the oversetting of open boats.

Their small DRAUGHT of WATER should occasion many canals to be dug, as the expence will be inconsiderable ; and the advantage of numerous canals is sufficiently known in Europe.

The same PROPERTY will have the effect of opening numberless ports, which, from their small depth of water, could never before receive vessels. Nay, where ports are not to be found, every sand-bank may be easily made to answer the purpose ; for, as a vessel of this kind will take the ground with each of its three keels at the same instant, so, if the vessel be run on the beach at high water, the crew will be able, by the return of the next high water, to dig a dock fit for her reception ; and, with little trouble, she can be again set afloat upon the sea.

As these Vessels sit upright on the ground, every bank is equally fit, with a dry dock, for their repairs : A matter of great importance to ships which may have received damage, or have sprung a leak near a coast deficient in ports.

It was my wish to have built the EDINBURGH on a scale sufficiently large to have rendered her fit for a voyage of any length. This would have shewn more clearly the principle of her construction, and would have enabled me to ascertain, with greater accuracy, not only the best forms and proportions of the three vessels, but also the proper distances at which they ought to be placed from each other. From an undertaking of such magnitude, however, I was not only prevented, by the attention I owed to the duties of a great business in which I was then engaged, but I was also restrained by prudence, having, during the late war, expended large sums in numberless experiments

experiments for the improvement of Artillery, with a view to aid my country, and having, since the peace, incurred much expence in building various vessels, with a design to improve Naval Architecture.

For these reasons, I was obliged to limit myself to the building the TRIPLE VESSEL, as now represented in the Engraving; and, as I have above hinted that she is not intended, in all respects, to be a model, it will be proper here to explain myself, and to offer my opinion with respect to the figures of the vessels which may be best adapted to the different services in which they may be employed.

For inland navigation, the bottom should be flat and long, while the sides may be straight.

For the purpose of coasting, the bottom should rise a little, and the sides be somewhat round; for, although the roundness of the sides be of small importance, with a view to STIFFNESS, yet it will, in certain situations, give strength to resist the repeated beating of the sea against the sides of the vessel.

For long voyages, the bottom should be still sharper, and the sides rounder.

As to the breadth, that should be regulated by the intended tonnage of the vessel.

The depth of the vessel must be determined in part by the tonnage, and in part by the diameter of the WHEELS. These last must, in large ships, work under the lower-deck beams; and, between the two beams immediately above each WHEEL, there must be a sufficient space to permit it to pass, when to be raised out of the water. When the WHEEL has only four arms, and the outer circle of iron is kept within the wooden part of them, a few inches

more

more than the fourth part of the circumference of the WHEEL will be a sufficient space between the beams.

With regard to the dimensions of the WHEEL, it appears to me that one from seven to eight feet of diameter is as large as there can be any occasion to employ, whatever the burden of the ship may be.

The number of the WHEELS should be in proportion to the length of the ship, and the number of the crew.

As to the DISTANCE which ought to be between the vessels, it is experience alone which can determine this matter with precision. In that which is represented in the Engraving, the distance between the vessels was necessarily determined by the law already alluded to, and which obliged me to direct that the breadth should bear the legal proportion to the length. I am of opinion, however, that no ships, of whatever size, will require above one or two feet greater distance between the vessels than in that on the Plan.

Having thus thrown out these few Remarks upon the INVENTION I now communicate to the world, I submit it to their consideration. As to the truth of my system, it may easily be ascertained by any Prince in Europe. It will be an undertaking patriotic and beneficent; and, if followed with the success which I expect, must be attended with the happiest consequences to his subjects.

As to myself, after some years bestowed in study and application to this subject, the present time forms to me a period of repose and satisfaction. The vessel, of which the Engraving is annexed, is the eighth which I have had built, with a view to improve Naval Architecture. One of them, built

at a considerable expence, lies proscribed, and rendered uselefs, by the above mentioned STATUTE, enacted AFTER the Vessel was launched. Notwithstanding this, I was refused a LICENCE to make experiments with her at my own expence ; experiments unconnected with any fordid view, and which aimed at nothing but promoting the general welfare of mankind.

The light in which the utility of this INVENTION shall be viewed by the Public, will enable me to judge how far it may be proper to make known another SYSTEM, founded upon a combination of the Powers of an IMPROVED ARTILLERY with those of an IMPROVED NAVAL ARCHITECTURE.

That SYSTEM is of such a nature, as, from its very great superiority, to give a decided advantage to the State by which it shall first be adopted. My only view, however, being to promote the happiness of mankind, a discovery of this System will not be made, without having just reason to expect that it will be employed for that beneficent end.

Edinburgh, February 1787.



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EXPLANATION

OF THE

FIGURES.

FIGURE I.

- A The Bowprit.
- B The Foremast.
- C The Mainmast.
- D The Mizzenmast.
- E The Cabin.
- F The Tiller of the Center Vessel.
- G The Tiller of the Larboard Vessel.
- H The Larboard Rudder.
- III The Rails.
- K Stem of the Center Vessel.
- L Stem of the Larboard Vessel.
- MM The Water Line, marking the Vessel's draught of water.

FIGURE II.

- A A a Section of the Cabin.
- B The Larboard Wheel.
- C A part of the Starboard Wheel.
- DD The Grooves in which the Axes of the Wheels are raised or depressed.
- EE The Water Line.

D

FIGURE

F I G U R E III.

A Plan of the Deck representing it without the Cabin.

A A A A The Hatchways.

B B B B B The Stations of the Pumps.

C The Bowsprit.

D The Station of the Foremast.

E That of the Mainmast.

F That of the Mizenmast.

G G Sections of the Wheels.

H H H H The Cranks for working the Wheels.

I I I I The Wells or void Spaces between the center vessel and the two other vessels in which the Wheels revolve.

N. B. By an error in the Drawing, the Wells have been made three and one-half feet too long.

K K K K K K K K Open spaces in the vessels where the men stand to work the Wheels.

L L a Circular Stage on which the helmsman stands, to steer the ship. It being raised two feet four inches above the deck, he can from thence see over the cabin, and observe objects in every direction.

M The Main Tiller.

N The Starboard Tiller.

O The Larboard Tiller.

P P The Steering Board, by which the three Tillers are connected. By its means, the center Tiller, when moved, produces similar movements in the other two Tillers.

Q Q Q Q Q Q Q Q The Stations of the Timber Heads and Rails.

R R The Bits to which the Cables are fastened when the Ship is at anchor.

S S The Bumkins to which the Tacks of the Forefail are extended, according to the Tack on which the Ship stands.

G U R E

F I G U R E IV.

The Forepart of the Ship, with the Under Arm of the Wheel at its full Dip.

A A The Water Line.

F I G U R E V.

The After-part of the Ship, with the Under Arm of the Wheel at its full dip.

A A The Water Line.

F I G U R E VI.

A View of the Edinburgh under Sail, and the Wheels working.

F I G U R E VII.

Another View of her under Sail, with the Wind on the Quarter, and the Wheels raised out of the Water.

F I G U R E VIII.

A Plan of the Wood Work of the Wheel when seen Edgeways.

F I G U R E IX.

A Plan of the Iron-work of the Wheels.

A A A A The Arms.

B B Circles to strengthen the Arms.

F I G U R E X.

A Perspective View of the Wheel.

FIGURE IV

The Forepart of the Ship, with the Under Arm of the Wheel at its

full Dip.

A A The Water Line.

FIGURE V

The After-part of the Ship, with the Under Arm of the Wheel at its

full dip.

A A The Water Line.

FIGURE VI

A View of the Edinburgh under Sail, and the Wheels working.

FIGURE VII



Another View of her under Sail, with the Wind on the Quarter, and the Wheels raised out of the Water.

FIGURE VIII

A Plan of the Wood Work of the Wheel when full.

FIGURE IX

A Plan of the Iron Work of the Wheel.

AAA The Arms.

BB Circles to strengthen the Arms.

FIGURE X

A Perspective View of the Wheel.

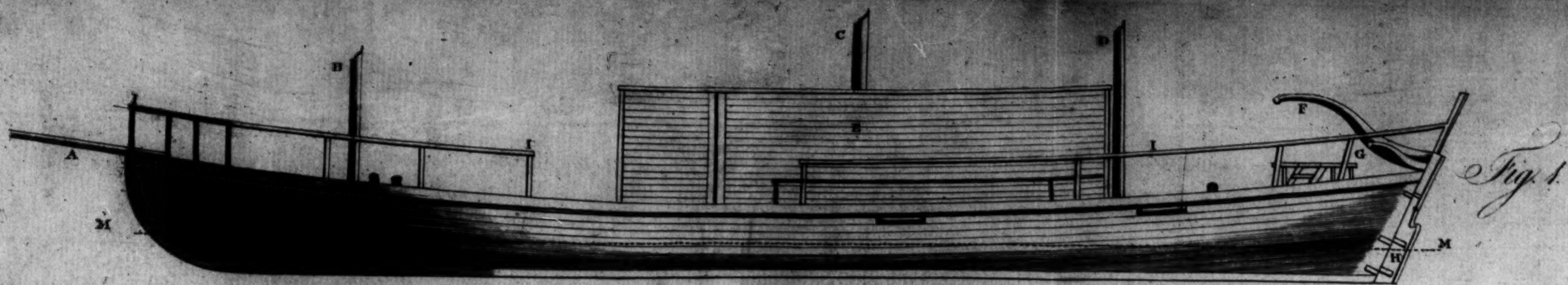


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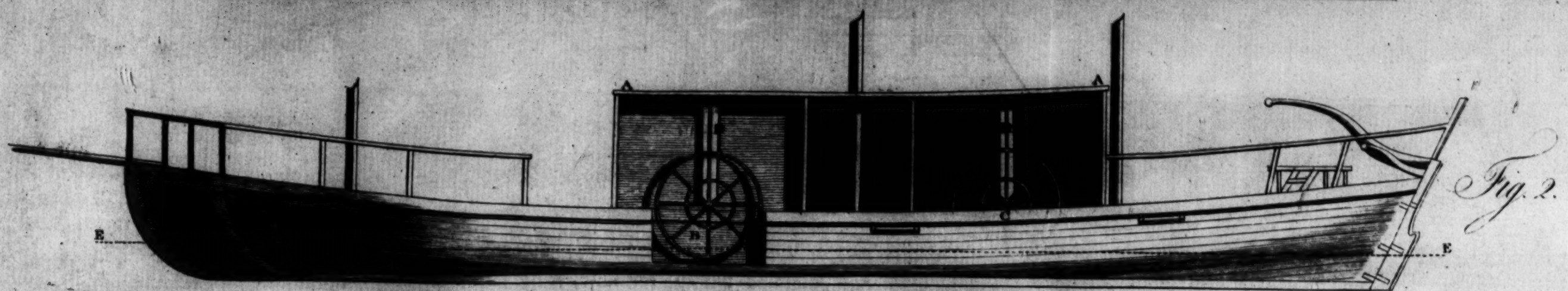


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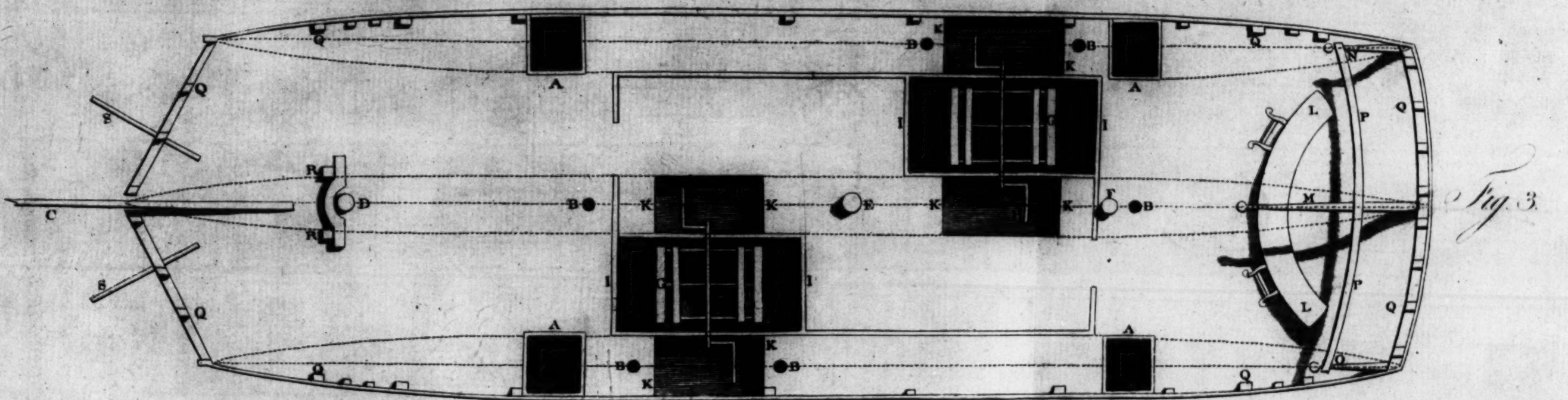


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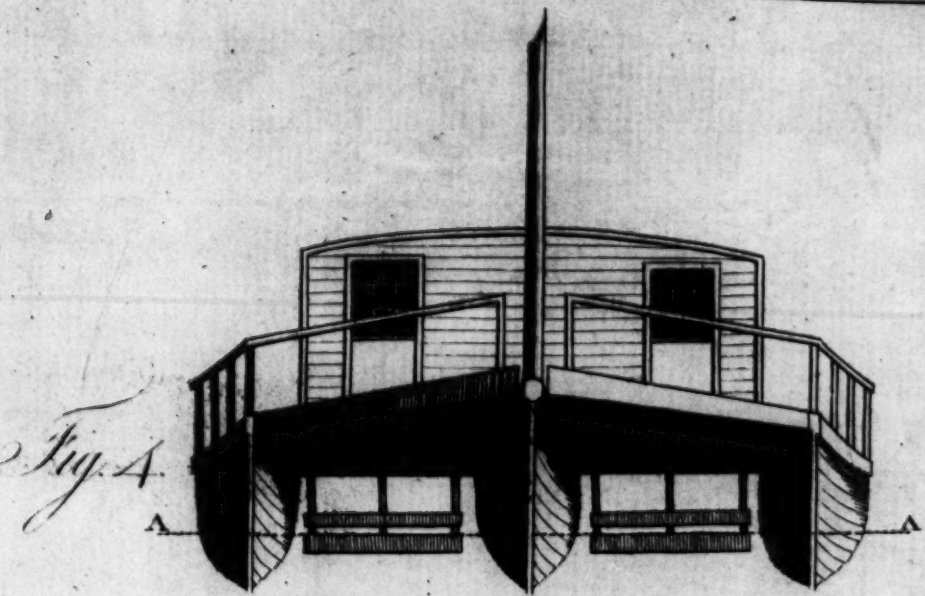


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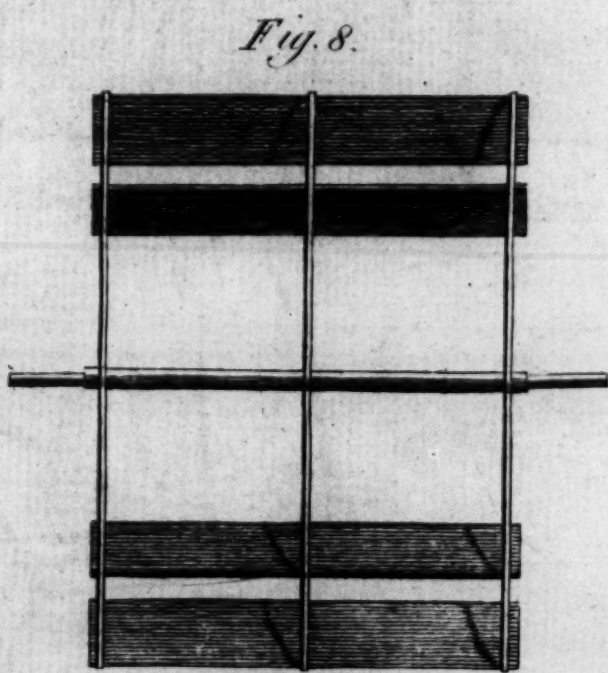


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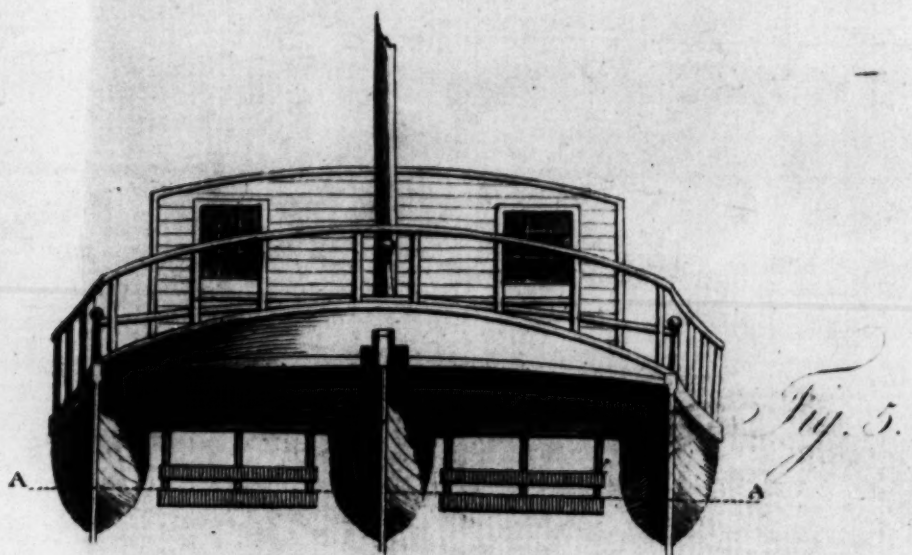


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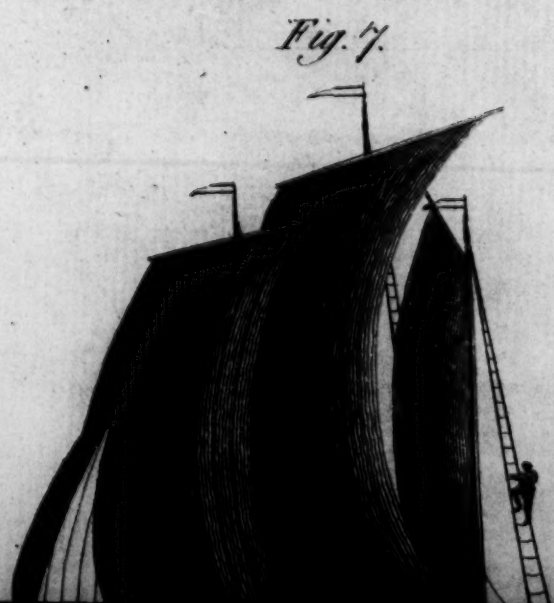


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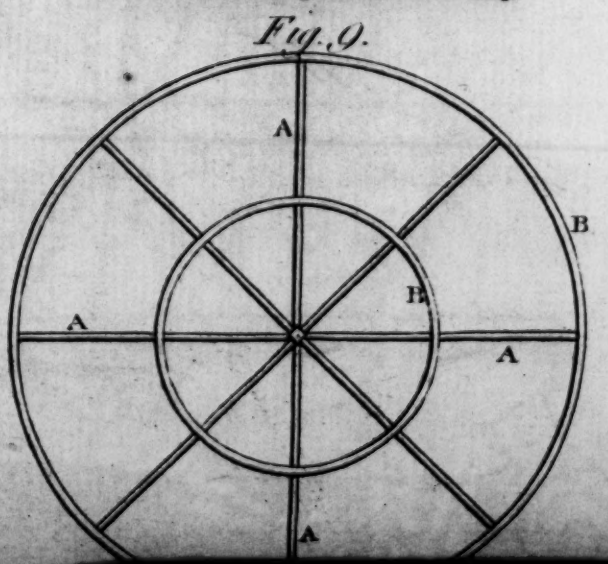


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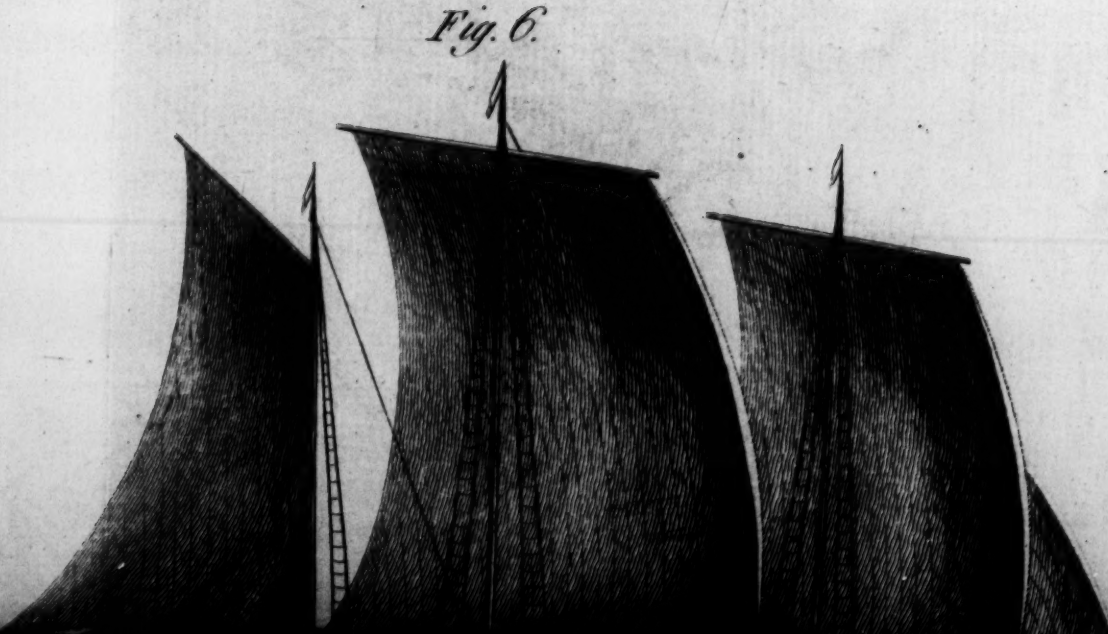


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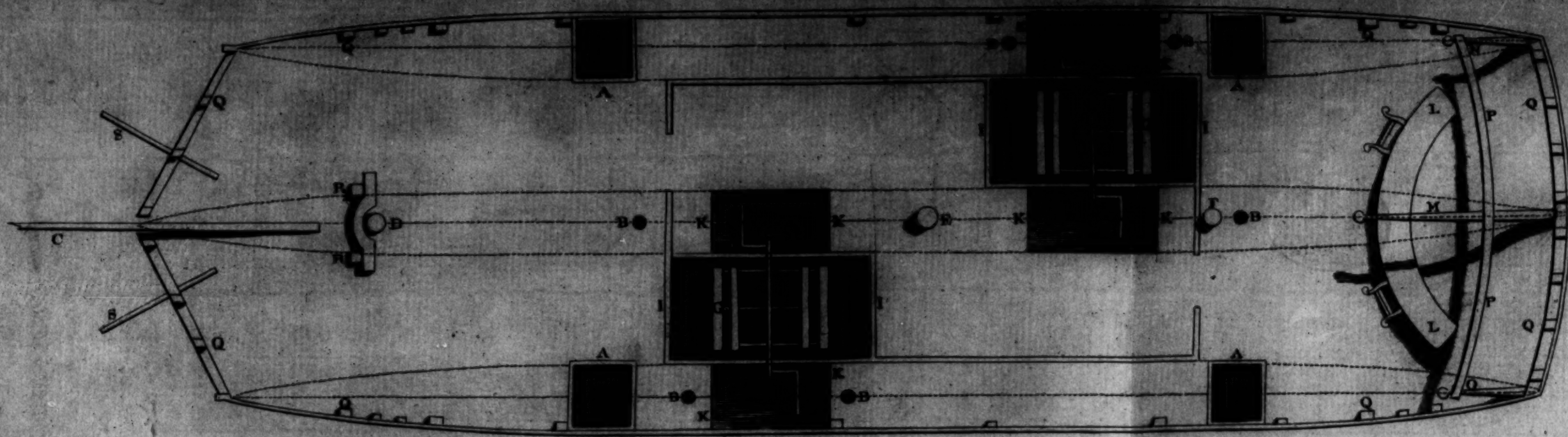


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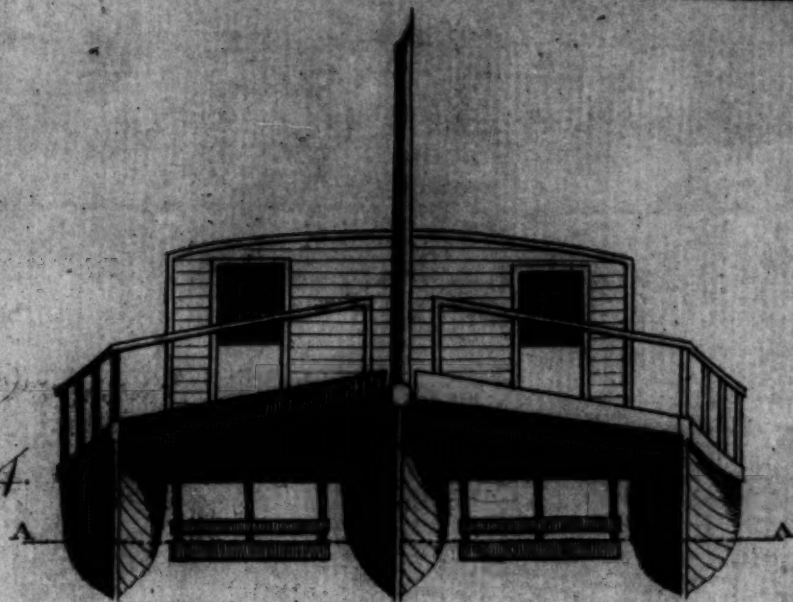


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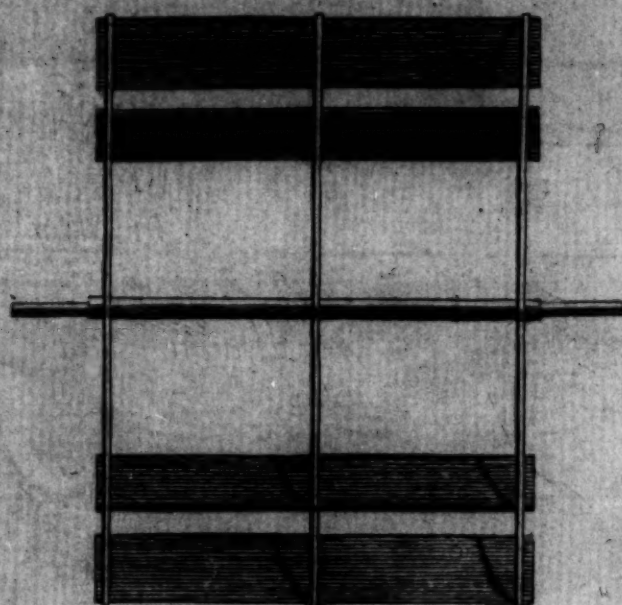


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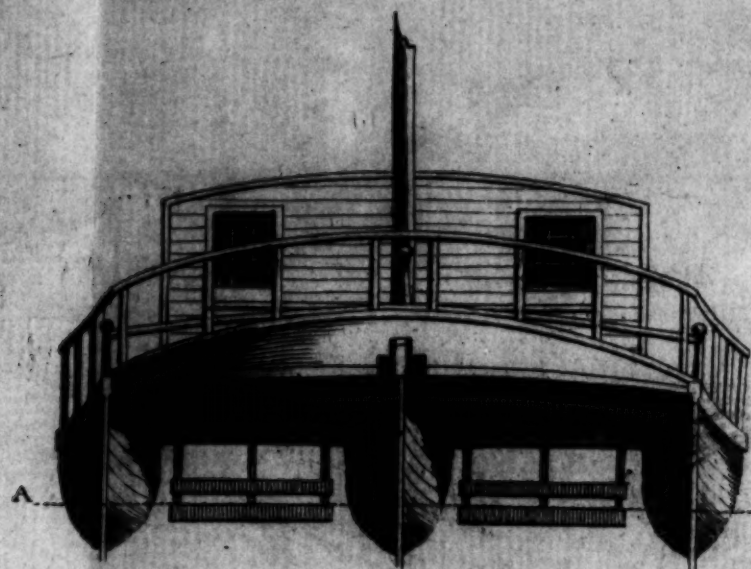


Fig. 5.



Fig. 7.

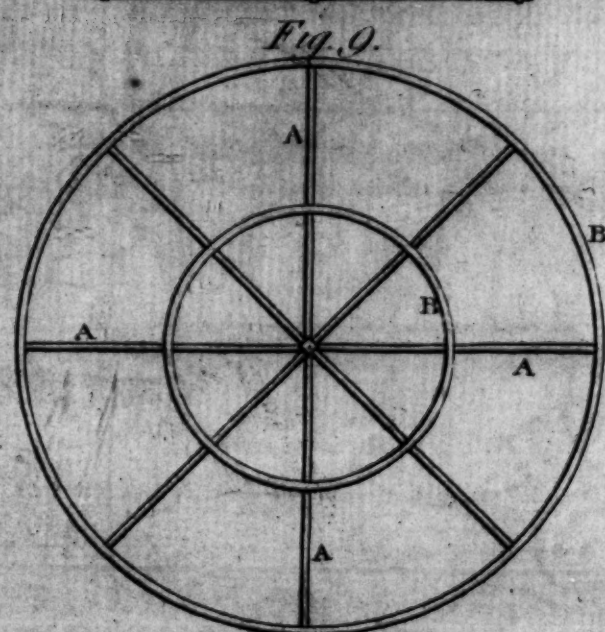


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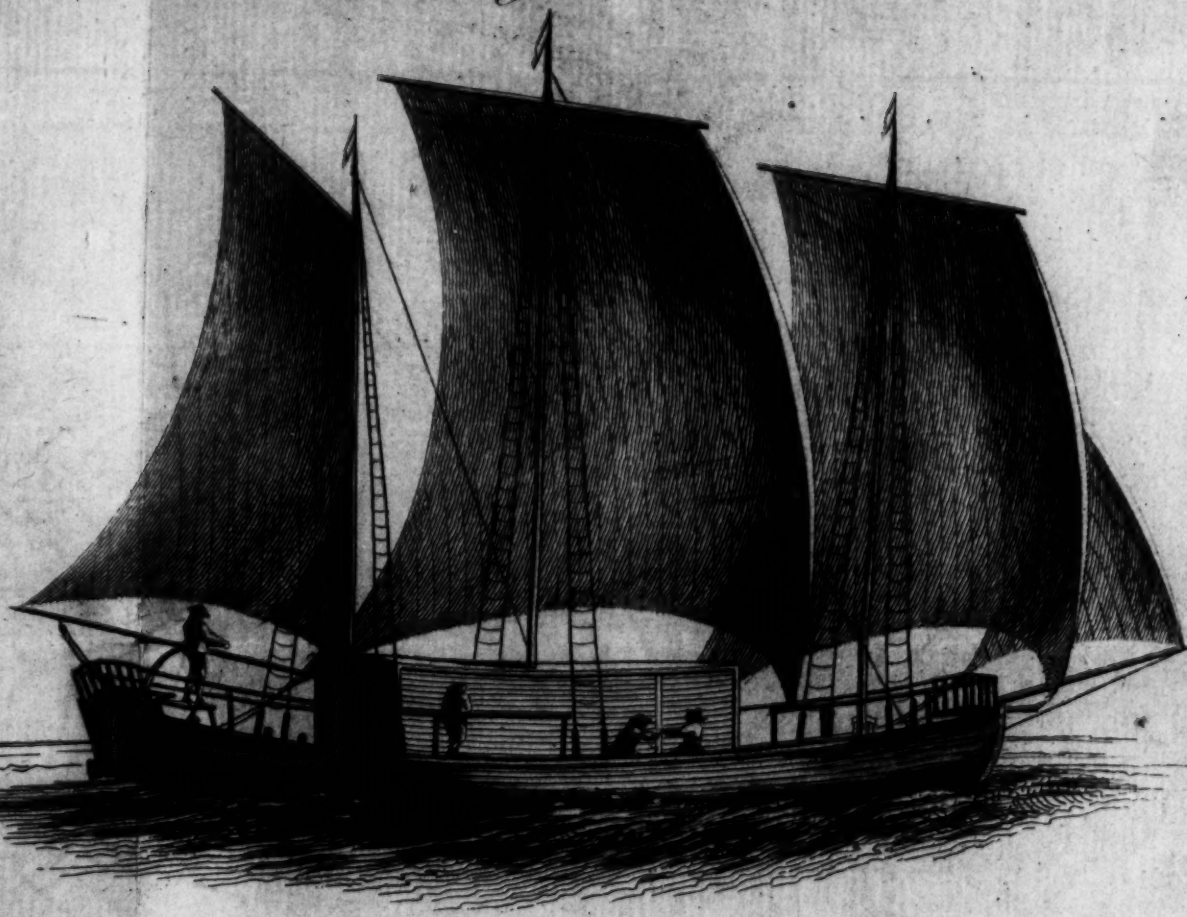


Fig. 6.

Scale of Feet for Fig. 8, 9, 10.

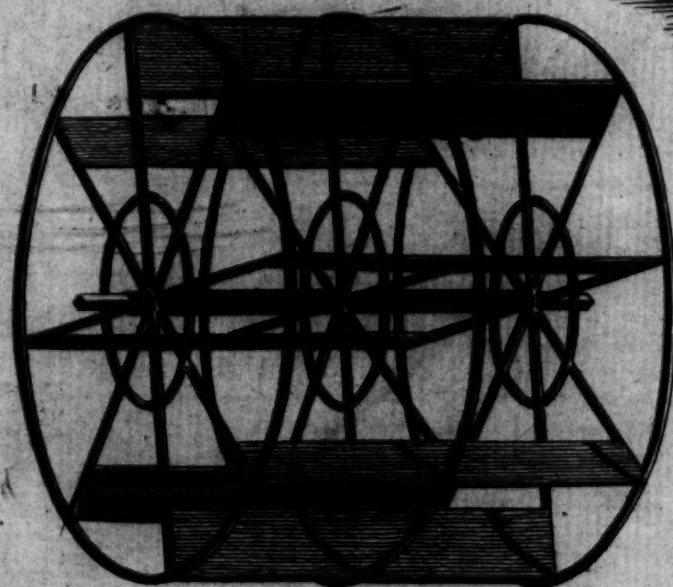
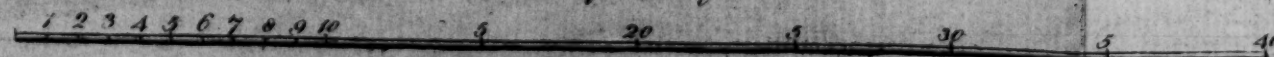


Fig. 10.

Scale of Feet for Fig. 1, 2, 3, 4, 5.



*The Elevation, Section, Plan and Views,
of a **TRIPLE VESSEL** and of **WHEELS**
to communicate Motion through the Water to the said
Vessel Invented by Patrick Miller Esq^r of Dalhington*

*This Vessel was put upon the Stocks at LEITH
the 17th Jan^y 1786, was launched the 14th Oct^r
thereafter and named the **EDINBURH**.*